

Appl. No. 09/801,602  
Amdt. Dated May 4, 2006  
Reply to Office Action of March 23, 2006

### REMARKS

Claims 1 to 9, 11, 13 to 14 and 16 to 18 are currently pending in the present application. Claims 1, 3 and 9 are amended. Claim 14 is cancelled. The amendments are supported by the application as originally filed. Therefore no new matter has been added by the amendments. Reconsideration of the present application, as amended, under 37 C.F.R. 1.116 is respectfully requested.

Claims 1 to 5, 8 to 9, 11, 13 to 14 and 16 to 18 stand rejected by the Action under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the limitation "in the requirement object models" is cited as having insufficient antecedent basis. Claim 1 has been amended and no longer claims the cited limitation. Claim 1 has further been amended to clearly define a family of complex systems having present and future members. It is submitted that claim 1 is now definite and appropriately fulfills the requirements of 35 U.S.C. 112. Moreover, claims 3 and 9 now find proper antecedent basis for the term "members of a family" in claim 1. Claims 2, 4 to 8, 11, 13 and 16 depend directly or indirectly from claim 1 and are, therefore, in appropriate form. Accordingly, applicant respectfully requests withdrawal of the rejection under 35 U.S.C. 112.

Claims 1 to 5, 8 to 9, 11, 13 to 14 and 16 to 18 stand rejected by the Action under 35 U.S.C. § 103(a) as being unpatentable over Regnell et al., "From Requirements to Design with Use Cases", *3<sup>rd</sup> Intl Workshop on Requirements Engineering – Procceding CAISE '97*, June 1997 (hereinafter "Regnell") in view of Don Heim, "Requirements Management with Use Cases" Software Technology Conference May 1999 (hereinafter "Heim").

Independent claim 1 is amended in order to more clearly define the present invention over the cited references. Amended claim 1 is directed to a method for

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simultaneously developing a family of complex systems, the family having present and future members, the family having a common software architecture platform. The family of complex systems includes a plurality of complex systems. The method includes the steps of constructing an initial requirements object model which explains abstract concepts in terms of a structured vocabulary, forming an initial set of use cases based on the initial requirements object model such that the use cases are expressed using the structured vocabulary of the requirements object model, the use cases describing interaction of users with each of said complex systems in terms of the structured vocabulary explaining the abstract concepts, forming an initial functional requirements specification (FRS) which includes use cases, forming an amended requirements object model based on the initial FRS and thus in consideration of the initial set of use cases, forming additional use cases based on analysis of the amended requirements object model, changing the FRS in light of the additional use cases, forming another amended requirements object model based on the changed FRS simultaneously with the formation of the additional use cases, repeating the additional use case formation step, the FRS changing step and the amended requirements object model formation step until all desired use cases have been formed and considered, and obtaining a final requirements object model once all of the desired use cases have been considered. Claim 1 has been amended to additionally claim that since the additional use cases are formed simultaneously with the formation of the amended requirements object models, the amended requirements object models are thereby formed during the formation of the functional requirements specification. Claim 1 now further claims that the method supports simultaneous development of several of the present members of the family of complex systems as well as later addition of the future members of the family of complex systems.

Neither Regnell nor Heim, taken either alone or in combination, teach the invention as set forth in claim 1. Regnell simply describes a method for modeling how new requirements are distributed on a hierarchy of existing system components. The method applies the use case modeling in the transition from requirements to design, with focus on requirements traceability and dynamic system behavior modeling. As

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described, the method is based on a recursive process where functionality specification and distribution activities are applied at different abstraction levels in the component hierarchy. The method, called FRED (From Requirements to Design) focuses on the modeling of the result of requirements distribution. However, Regnell fails to prescribe how the architecture is to be changed or extended to meet the new requirements. Moreover, the FRED method does not disclose a specific method or notation for data modeling.

The Action concedes that Regnell does not disclose successive amending of an ROM simultaneously with developing use cases and further repeating the cycle ROM change followed by Use Case changes reflecting the changed ROM until a fine-tuned ROM is achieved. The Action further concedes that Regnell does not explicitly disclose the steps of (1) constructing an initial requirement object model (ROM), (2) an initial set of use cases, (3) an initial FRS and forming an amended ROM, forming additional use cases based on the amended ROM, (4) changing the FRS simultaneously with the additional use cases, repeating formation of additional use cases, (5) amending the FRS and ROM until desired use cases have been formed and considered, and (6) obtaining a final ROM once all the desired use cases have been considered. In citing Regnell as rendering the claimed invention obvious, the Action makes an expansive and unsupported theoretical leap by proposing a blanket assertion that iterative adjustments to graphical representation or model representation data like those disclosed by Regnell was known practice at the time of the present invention because it "is much preferred to spend resources up front" than to rectify problems downstream. Even if the stated premise is accepted as true, a preference to spend resources up front rather than down stream still clearly fails to disclose a method for simultaneously developing a family of complex systems the method having the steps of claim 1. Moreover, a concern for economy of resources during production if employed, as suggested, as a means for rendering an invention obvious would have effectively rendered obvious every invention since the dawn of man.

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The Action then proposes that it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement the ROM by Regnell in light of the incremental approach by Heim. Heim is described by the Action as a method for capturing requirements for an information system related to a Patient-Record Military Health System using Use Cases analogous to Regnell's that discloses requirement capture using use cases and incremental changes via iteration of scenarios involving creating model and use cases until a suitable prototype can be tested.

Applicant asserts that even if Regnell and Heim were combined, as suggested, the cited combination fails to disclose a method for simultaneously developing a family of complex systems as claimed in claim 1. Heim is directed to a means for providing decision makers with integrated information resources necessary to optimize health service via a computer-based patient record. Specifically, Heim discloses a method for capturing requirements for an information system. As shown in the Process Overview on page 8, Heim describes a requirements management process in which a model is created from testing and use case definition prior to full-scale development. However, the Process Overview clearly shows that Heim fails to disclose the method for simultaneously developing a family of complex systems having a common software architecture platform as claimed in claim 1. Specifically, Heim fails to teach that additional use cases are formed simultaneously with the formation of the amended requirements object models, such that the amended requirements object models are formed during the formation of the functional requirements specification. Heim additionally fails to teach a method that supports simultaneous development of several present members of a family of complex systems as well as later addition of new members of the family. In contrast, the invention of claim 1 provides a development method for a family of complex systems that supports simultaneous development of several present members of the family as well as later addition of future members. Thus, developing an object model during the requirement specification activity, as claimed in claim 1, is a novel and inventive step in view of both Regnell and Heim.

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Additionally, according to the invention of claim 1, the use cases are developed hand in hand with the requirement object model. The requirements specification is not considered finished until these use cases are expressed in the terminology defined by the requirements object model. The approach of authoring the use cases hand-in-hand with the set-up of the requirement object model achieves that the development method takes account of future evolution both from a conceptual point of view as generated in the FRS as well as from the point of view of the interactions between systems and users as generated by the requirement object model. In particular, future requirements as foreseen from the requirement object model are also included in the FRS. Thus, owing to the hand-in-hand set-up, the development method according to the invention of claim 1 achieves the combination of the FRS and the requirement object model in a more complete and accurate manner. That is, the development method of the present invention supplies a complete description of all family members. Notably, completeness and accuracy are improved because any misunderstandings are adequately resolved almost immediately and do not propagate into further stages of the development. The advantages of having a complete and accurate combination of the FRS and requirements object model also pertain to the development of a single new complex system. That is, the method according to the invention may also be advantageously applied to the development of a single new complex system. Moreover, when developing a family of several members, superfluous diversity within the family of complex systems is avoided. Both Regnell and Heim fail to disclose use cases that are developed hand in hand with the requirement object model such that superfluous diversity within a family of complex systems may be avoided.

Moreover, the invention of claim 1 achieves several advantages not described, let alone contemplated by the methods of either Regnell or Heim. The most important advantage of the invention of claim 1 is a significantly improved clarity and consistency of the FRS. Since the method according to claim 1 results in a design specification of a whole family, rather than of a single system, the specifications reflect that fact. Hence, the specifications and the model are made independent of the concrete choices for the

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individual products to be implemented as members of the family. In this way, the specifications and the model form a common basis for the whole product family, stressing the commonalties instead of the differences between the products. This principle is important because it helps to eliminate inessential differences between the products that would otherwise arise naturally, especially when different people are responsible for different products in the family.

Accordingly, even if Regnell and Heim were combined, as suggested by the Action, the cited combination fails to teach each element of claim 1. In view of the foregoing, independent claim 1 is patentable over Regnell and Heim when taken either singly under 35 U.S.C. § 102 or in combination under 35 U.S.C. § 103(a). Therefore, claim 1 is patentable over all of the references of record under 35 U.S.C. § 102 as well as 35 U.S.C. § 103(a). Accordingly, the rejections under 35 U.S.C. § 103(a) of claim 1 should be withdrawn and claim 1 should be allowed.

Claims 2 to 9, 11, 13, and 16 to 18 are either directly or indirectly dependent on claim 1 and are patentable over the references of record in view of their dependence on claim 1 for at least the reasons discussed and because the references of record do not disclose, teach or suggest each of the limitations set forth in claims 2 to 9, 11, 13, and 16 to 18.

Claim 3 stands rejected by the Action under 35 U.S.C. § 103(a) as being obvious over Regnell and Heim in view of U.S. Patent No. 6,366,683 to Langlotz (hereinafter "Langlotz"). As discussed, the cited combination of Regnell and Heim fails to teach or suggest a method for simultaneously developing a family of complex systems as claimed in claim 1. Langlotz, directed to a system and method of generating an image analysis report relating to an image of a subject, also fails to disclose the invention of claim 1. Accordingly, claim 3, depending from claim 1 and adding further features thereto, is patentable over the combination of Regnell, Heim and Langlotz for at least the reasons discussed.



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Claims 6 and 7 stand rejected by the Action under 35 U.S.C. § 103(a) as being obvious over Regnell and Heim in view of U.S. Patent No. 6,366,683 to Langlotz (hereinafter "Langlotz"). As discussed, the cited combination of Regnell and Heim fails to teach or suggest a method for simultaneously developing a family of complex systems as claimed in claim 1. Again, Langlotz, directed to a system and method of generating an image analysis report relating to an image of a subject, also fails to disclose the invention of claim 1. Accordingly, claims 6 and 7, depending from claim 1 and adding further features thereto, are patentable over the combination of Regnell, Heim and Langlotz for at least the reasons discussed.

In view of the foregoing, Applicant respectfully submits that all claims presented in this application patentably distinguish over the prior art and the cited combinations of the same. Accordingly, Applicant respectfully requests favorable consideration and that this application be passed to allowance.

### Conclusion

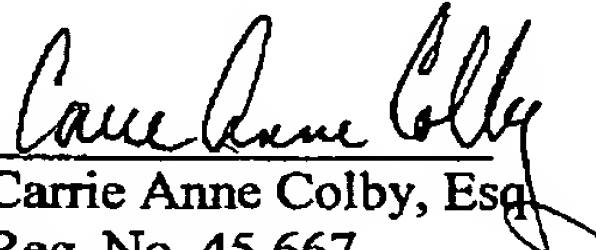
In view of the foregoing, Applicant respectfully submits that all claims presented in this application are currently in condition for allowance. Accordingly, Applicant respectfully requests reconsideration under 37 C.F.R. 1.116 and that this application be passed to allowance.

Should any changes to the claims and/or specification be deemed necessary to place the application in condition for allowance, the Examiner is respectfully requested to contact the undersigned to discuss the same.

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Applicant's representative believes that this response is being filed in a timely manner. In the event that any extension and/or fee is required for the entry of this amendment the Commissioner is hereby authorized to charge said fee to Deposit Account No. 14-1270. An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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